



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,772	09/06/2006	Etienne Chapelain	8952-000014/US/NP	4467
27572	7590	01/22/2009	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303				DIAZ, THOMAS C
ART UNIT		PAPER NUMBER		
3656				
MAIL DATE		DELIVERY MODE		
01/22/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,772	CHAPELAIN ET AL.	
	Examiner	Art Unit	
	THOMAS DIAZ	3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 10/08/2008.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-7 and 9-19 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-7 and 9-19 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 08 October 2008 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Status of Claims

This office action is in response to the reply filed on 10/08/2008. The examiner appreciates and acknowledges applicant's response.

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the
- “said gear element on which said one or each anti-backlash gear is mounted is a ring gear” of claim 3,
 - “wherein one of said two anti-backlash gears engages a first face of a tooth of another of said first gear and said second gear, and another of said two anti-backlash gears engages a first face of another tooth of said another of said first gear and said second gear.” of claim 10,

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure

is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 10 is objected to because of the following informalities: Claim 10 recites "a steering wheel defining a first gear" and "a steering column defining a second gear..." The word "defining" could mean the steering wheel is a first gear. Perhaps changing the word "defining" to --including-- would fix the ambiguity and apparent inaccuracy. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 10-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

5. Claim 10 recites “wherein one of said two anti-backlash gears engages a first face of a tooth of another of said first gear and said second gear, and another of said two anti-backlash gears engages a first face of another tooth of said another of said first gear and said second gear.”

It is unclear from the disclosure how the two anti-backlash gears mesh with the gear they are engaging and this is not supported by the specification. As is well known in the art, a first face of teeth on a gear would usually be the same flank (for example, left flank) of each successive tooth. A second face of the teeth would be the corresponding other flank of each successive tooth. In the present instance, how would the anti-backlash gears prevent backlash if each one is engaging the same flank on a different tooth? That would also mean they're biased in the same direction which appears to contradict the applicant's invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 1-7,9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

8. Claims 1 and 9 recite "said at least one anti-backlash gear having teeth configured so as to align substantially with teeth of said gear element upon, said at least one anti-backlash gear being rotatably biased relative to the said gear element upon which it is mounted towards a position in which the said teeth of the said at least one anti-backlash gear are displaced from the said corresponding teeth of the said gear element". The claim is very confusing since it has contradicting limitations. The claim requires the teeth of the anti-backlash gear to both "align substantially with the teeth of said gear element" and to be "displaced from the corresponding teeth of said gear element". Substantially aligned would mean that the teeth are aligned with a small amount of play. With the teeth being displaced would mean they can't be substantially aligned. How can the teeth be aligned and displaced at the same time? Or, which limitation does the applicant intend to claim?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent et al. (EP1199243A) in view of Vertemati (EP 1174592A).

Regarding claims 1,

Laurent et al. discloses a steering wheel (fig.1, 9) having a first gear element (fig.3, 4; pinion gear) and a second gear element (fig.3, 14; ring gear) mounted on or mountable on a steering column (fig.3, 5), said first and second gear elements inter-engaging one another.

Laurent et al. fails to disclose the arrangement further comprising at least one anti-backlash gear mounted directly on one of said gear elements, said at least one anti-backlash gear having teeth configured so as to align substantially with teeth of said gear element upon which it is mounted, said at least one anti-backlash gear being rotatably biased relative to the said gear element upon which it is mounted towards a position in which the said teeth of the said at least one anti-backlash gear are displaced from said corresponding teeth of the said gear element, wherein said at least one anti-backlash gear is held in position by a retaining washer.

Vertemati teaches two anti-backlash gear (fig.1, 5b and 5c) mounted directly on a gear element (fig.1, 5a), said at least one anti-backlash gear having teeth configured so as to align substantially with teeth of said gear element upon which it is mounted (fig.1 shows teeth in alignment), said at least one anti-backlash gear being rotatably biased relative to the said gear element upon which it is mounted towards a position in which the said teeth of the said at least one anti-backlash gear are displaced from said corresponding teeth of the said gear element (fig.1; from disclosure it is clear that the springs bias the teeth of

anti-backlash gears so as to displace them and take up any backlash), for the purpose of preventing backlash and synchronizing the gears that are in mesh. Vertemati also teaches the use a retaining washer (fig.1, 24,25,23a-b) for the purpose of retaining antibacklash gears in position.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pinion gear disclosed by Laurent et al. to include the anti-backlash gears and the retaining washer, as taught by Vertemati for the purpose of preventing backlash and synchronizing the gears that are in mesh.

Regarding claim 3,

Laurent et al. in view of Vertemati discloses said gear element on which said one or each anti-backlash gear is mounted is a ring gear. Since the backlash gearing is directly mounted on the pinion gear which engages the ring gear then it is considered to be mounted on the ring gear as well.

Regarding claim 4,

Laurent et al. in view of Vertemati discloses said gear element on which said one or each anti-backlash gear is mounted is a pinion gear.

9. Claims 1-5, 10-14, 19, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent et al. (EP1199243A) in view of Damas (USP 4660432).

Regarding claims 1,

Laurent et al. discloses a steering wheel (fig.1, 9) having a first gear element (fig.3, 4; pinion gear) and a second gear element (fig.3, 14; ring gear) mounted on or mountable on a steering column (fig.3, 5), said first and second gear elements inter-engaging one another.

Laurent et al. fails to disclose the arrangement further comprising at least one anti-backlash gear mounted directly on one of said gear elements, said at least one anti-backlash gear having teeth configured so as to align substantially with teeth of said gear element upon which it is mounted, said at least one anti-backlash gear being rotatably biased relative to the said gear element upon which it is mounted towards a position in which the said teeth of the said at least one anti-backlash gear are displaced from said corresponding teeth of the said gear element, wherein said at least one anti-backlash gear is held in position by a retaining washer.

Damas teaches two anti-backlash gear (fig.1, 8 and 10) mounted directly on a gear element (fig.1, 6), said at least one anti-backlash gear having teeth configured so as to align substantially with teeth of said gear element upon which it is mounted (fig.3 and 4), said at least one anti-backlash gear being rotatably biased relative to the said gear element upon which it is mounted towards a position in which the said teeth of the said at least one anti-backlash gear are displaced from said corresponding teeth of the said gear element (fig.3 and 4, shows the teeth being rotationally biased to a displaced position), wherein said at least one anti-backlash gear is held in position by a retaining washer (fig.1, 9 and 11). These anti-backlash gear being for the purpose of preventing backlash or rattling and prolonging the life of meshing gears (col.1, lines 15-19).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the pinion gear disclosed by Laurent et al. to include the anti-backlash gears (fig.1, 8 and 10) and the retaining washer, as taught by Damas for the purpose of preventing backlash or rattling and prolonging the life of meshing gears (col.1, lines 15-21). The retaining washer would serve the predictable purpose of retaining the gearing in place.

Regarding claim 2,

Damas discloses two said anti-backlash gears are mounted on said gear element, the said two anti-backlash gears being biased in opposite directions (see fig.4 or col.1, lines 33-56).

Regarding claim 3,

Laurent et al. in view of Damas discloses said gear element on which said one or each anti-backlash gear is mounted is a ring gear. Since the backlash gearing is directly mounted on the pinion gear which engages the ring gear then it is considered to be mounted on the ring gear as well.

Regarding claim 4,

Laurent et al. in view of Damas discloses said gear element on which said one or each anti-backlash gear is mounted is a pinion gear.

Regarding claim 5,

Laurent et al. in view of Damas discloses said pinion gear is provided with two anti-backlash gears, the said anti-backlash gears each being in the form of a plate (see fig.1 of Damas), each said plate having an aperture therein (fig.1, 10), said aperture

defining portions to engage spring elements (see fig.1, holes into which springs 13 fit), the said apertures of the said two anti-backlash gears being co-aligned (fig.1, apertures are co-aligned with apertures of gear 6) and receiving said spring elements (fig.1, 13).

Regarding claim 10,

Laurent et al. discloses a similar device comprising:

- a steering wheel (fig.1, 9) defining a first gear (fig.3, 4; pinion gear);
- a steering column (fig.3, 5) defining a second gear (fig.3, 14; ring gear) meshing with said first gear;

Laurent et al. fails to disclose

- two anti-backlash gears directly mounted on one of said first gear and said second gear; and
- a plurality of spring elements for joining said two anti-backlash gears to said one of said first gear and said second gear, wherein said two anti-backlash gears are rotatably biased relative to each other and to said one of said first gear and said second gear, wherein one of said two anti-backlash gears engages a first face of a tooth of another of said first gear and said second gear, and another of said two anti-backlash gears engages a first face of another tooth of said another of said first gear and said second gear.

Damas teaches the use of:

- two anti-backlash gears (fig.1, 6 and 8) directly mounted on a gear (fig.1, 10)

➤ a plurality of spring elements (fig.1, 13) for joining said two anti-backlash gears to said gear (fig.1), wherein said two anti-backlash gears are rotatably biased relative to each other and to said one of said first gear and said second gear (see fig.1,3 and 4), wherein one of said two anti-backlash gears engages a first face of a tooth of another of said first gear and said second gear, and another of said two anti-backlash gears engages a first face of another tooth of said another of said first gear and said second gear (see fig. 3 and 4);

for the purpose of preventing backlash or rattling and prolonging the life of meshing gears (col.1, lines 15-19).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the pinion gear disclosed by Laurent et al. to include the anti-backlash gears (fig.1, 8 and 10), as taught by Damas for the purpose of preventing backlash or rattling and prolonging the life of meshing gears (col.1, lines 15-21).

Regarding claim 11,

Laurent et al. discloses said first gear is secured to said steering wheel (see fig.1 and 3).

Regarding claim 12,

Laurent et al. discloses said second gear is secured to said steering column (see fig.1 and 3).

Regarding claim 13,

Damas discloses said two anti-backlash gears are identically configured (see fig.1, they are of equal size).

Regarding claim 14,

Damas discloses said identically configured anti-backlash gears are inverted with respect to one another (see fig.1, they are on opposite sides of gear 10 and thus are inverted).

Regarding claim 19,

Laurent et al. fails to disclose a washer having a collar, said collar securing said washer to said one of first gear and said second gear;

Damas teaches the use of a washer (fig.1, 9 and 11) having a collar (fig.1, inner portion of washer 9 or 11 which engages the shaft), said collar securing said washer to a gear for the predictable result of retaining the gearing in place.

It would have been obvious to one of ordinary skill in the art at the time of the invention to make use of a washer having a collar, said collar securing said washer to said one of first gear and said second gear, as taught by Damas, for the predictable result of retaining the gearing in place.

10. Claims 6,15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent et al. (EP1199243A) in view of Damas (USP 4660432) as applied to claims 4 and 10 above, and further in view of Berthelsen (USP 2206831).

Regarding claim 6, 15 and 16,

Laurent et al. in view of Damas disclose each spring element passing through part of said aperture in one said plate which engages said spring element, and part of said aperture in the said other plate which accommodates said spring element (see fig. 1 In Damas; each spring element passes through the defined apertures).

Laurent et al. in view of Damas fail to disclose said spring elements are of substantially "C" shape and formed from a sheet material.

Berthelsen teaches the use of substantially "C" shaped springs (fig.1, 64) formed from a sheet material and used in an anti-backlash gear arrangement for the purpose of biasing the gears with respect to each other.

It would have been obvious to one of ordinary skill in the art to substitute the springs taught by Berthelsen with the springs disclosed by Damas since they would provide the same solution of biasing the gears with respect to each other. As long as the springs generate a biasing force they'd solve the same problem.

Allowable Subject Matter

11. Claim 9 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.
12. Claims 7, 9, 17, 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 1st and 2nd paragraph, set forth in this Office action.

Response to Arguments

13. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS DIAZ whose telephone number is (571)270-5461. The examiner can normally be reached on Monday-Friday 8:30am to 5:30pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Thomas Diaz/

Examiner, Art Unit 3656

/Richard WL Ridley/
Supervisory Patent Examiner, Art Unit 3656